

## TECHNICAL SPECIFICATION OF THERMAL PROTECTOR, ST-22

### 1. APPLICATION SCOPE

ST-22 is an Automatic Reset Thermal Protector and is applied to OVERHEAT PROTECTION.

### 2. STRUCTURE

2-1. Type: Single-Pole Type using Bi-metal

2-2. Dimension: Please refer to the attachment.

### 3. SPECIFICATIONS

#### 3-1. Electrical Ratings

Rated Voltage	AC 125 V	AC 250 V	DC 48 V
Rated Current	10 A	7 A	3 A / 2.2A
Rated Load	Resistive Load		

#### 3-2. Pre-setting Temperature

Operating Temperature	Preset Temp. $\pm 5^{\circ}\text{C}$
Reset Temperature	Operating Temp. $- 30^{\circ}\text{C} \pm 15^{\circ}\text{C}$

During rising of temperature, when the contacts are open, it's called "Open Temperature". During dropping of temperature, when the contacts are closed, it's called "Reset Temperature".

Calibration Verification: The temperature in a convection oven (electrically heated, static air-oven) is to be increased or decreased at the rate of  $1^{\circ}\text{C}$  per minute. The current should be within 100mA.

#### 3-3. Insulation Resistance

Insulation resistance between on-current-part and off-current-part (case & terminal) should be over  $100\text{M}\Omega$  when measured with DC500V tester.

#### 3-4. Withstand Voltage

It shall withstand for one minute under AC1,500V/leakage current 10mA or withstand for one second under AC1,800V/leakage current 10mA when applied between on-current-part and off-current-part (case & terminal).

#### 3-5. Contact Resistance

Not greater than  $50\text{m}\Omega$  between two lead wires using DC6V/1A voltage drop method (based on standard lead wire, 70mm long with 7mm stripped).

#### 3-6. Ambient Temperature

Under Normal Conditions

Lower Limit:  $-20^{\circ}\text{C}$

Upper Limit:  $10^{\circ}\text{C}$  above its higher limit of operating temperature

During Overshoot

Not greater than  $50^{\circ}\text{C}$  above its operating temperature

### 4. RELIABILITY TESTING

#### 4-1. Endurance Test

It should have no defects after 10,000 cycles (6,000 cycles for DC 48V/3A) of on-off testing through repeated heating and cooling with 60Hz rated voltage and rated current(power factor = above 90%). And when measuring the operating temperature with a method of above 3-2, the temperature should be within  $\pm 5^{\circ}\text{C}$  in case of under  $-100^{\circ}\text{C}$ - products and  $\pm 5\%$  temperature in case of over  $-100^{\circ}\text{C}$ - products compared with measured value before testing and satisfy the requirement of above 3-3 and 3-4 and the contact resistance should be below  $100\text{m}\Omega$ .

#### 4-2. Heat Resistance Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after placing 24 hours in convection oven set by  $150^{\circ}\text{C}\pm 3^{\circ}\text{C}$ .

#### 4-3. Cold Resistance Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after placing 24 hours in a convection oven set by  $-20^{\circ}\text{C}$ .

#### 4-4. Moisture Proof Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after placing 24 hours in a convection oven set by 95% relative humidity and 40°C.

#### 4-5. Thermal Shock Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after applying 5 cycles of thermal shock(-20°C±3 for 30 minutes and +150°C±3 for 30minutes is one cycle).

#### 4-6. Vibration Resistance Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after 30 minutes of vibration in three ways under oscillation conditions of 20-60Hz and amplitude of 1mm.

#### 4-7. Drop Shock Test

It should satisfy the requirements described in the above 3-2, 3-3, 3-4 & 3-5 after dropping from 80cm height to 1cm-thick wood block.

#### 4-8. Pulling Strength Test of Lead Wire

It should have no damage when applying 3kg-pulling force to one lead wire in axial direction.

#### 4-9. Strength Test of Case

It should have no damage when pressing the surface of the case with 10kg force rod of Ø1 for one hour.

### **5. MARKING & PACKING**

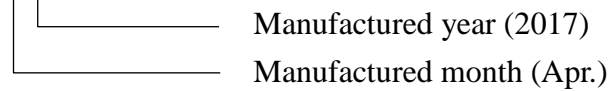
#### 5-1. Marking

Brand name, model number, operating temperature, manufacturing lot number and approval marks will be printed on the surface of the product. Product name, model number, operating temperature, electrical rating (voltage/current), approval marks, quantity and manufacturer's name would be printed on inner box.

5-2. Lot Number

Lot number will include one letter alphabet and one letter number.

Ex) D 7



5-3. Operating Temperature

Operating temperature will be marked with “C” which stands for “°C”.

Ex) 135C → (135°C)

5-4. Model Number

Model number: ST-22

5-5. Packing

Inner Box: 1,000pcs (100pcs per each vinyl pack X 10 packs)

Outer Box: 10,000pcs (10 inner boxes)

\* Based on 70mm long wire

**6. PRECAUTIONS**

6-1. Do not drop thermal protectors to hard concrete plate to prevent possible damages.

6-2. Do not use thermal protectors in applications exceeding the rated voltage and current. Otherwise the electrical contacts may melt and cause a malfunction in the thermal protector.

6-3. Transformed thermal protectors may not work properly.

6-4. In case of any damage to the product owing to artificial force, it may not work normally.

6-5. Do not apply strong pressure to the case because it is made up of thin plastic.

6-6. When working on the lead wires, the wires should be bent at least 3mm away from epoxy sealing. If not, the sealing can be damaged and have effect on the function of the product. To avoid the possible damage, using proper tools

for wire process is suggested.

6-7. To obtain the optimum performance, it needs to be stored in the correct environment. The storage condition should be:

Temperature: From -10°C to 40°C

Humidity: No more than 75% Rh

Free from direct sunlight and corrosive gas.

## **7. Others**

7-1. Those subjects which are not defined in this specifications or any doubt arising from the execution of the specifications will be discussed separately and added or corrected specially when mutually agreed.

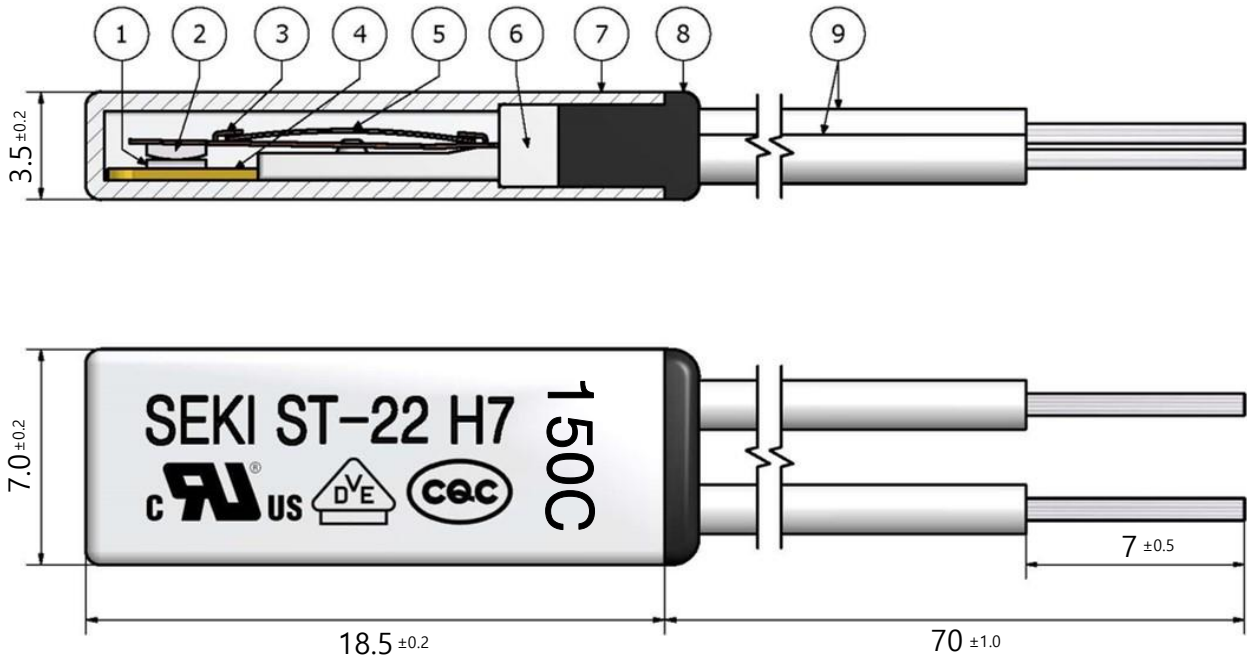
7-2. If any doubt arise during the incoming inspection at your end regarding the specifications of the thermal protector, please inform us immediately and we shall make an effort to settle the matter in an amicable manner.

7-3. If any doubt arise about the specifications after secondary process at your end, the scope of discussion to settle the matter will be limited to the thermal protector only.

7-4. The standard color of lead wire is white, and it is available in a variety of other colors. Please, contact SEKI CONTROLS CO., LTD for more information.

7-5. Specifications described in this leaflet can be changed without any notice for quality improvement.

# ST-22 STRUCTURE

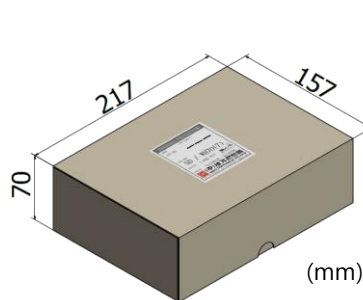


## \* Parts List

Part No.	Parts List	Material	Description	Remarks
1	Fixed Contact	AgNi/Cu	90AgNi/Cu	
2	Movable Contact	AgNi/Cu	90AgNi/Cu	
3	Action Plate	BeCu	BeCuR11-HT	
4	Fixed Plate	Brass	EH	
5	Disc	Bimetal		
6	Base	PBT	94V-0	
7	Case	PBT	94V-0	
8	Sealed Resin	Epoxy	94V-0	
9	Insulated Lead Wire	Lead Wire	UL3266 AWG22 WH	

## \* Packaging

- Inner Box: 1,000pcs
- Carton Box: 10,000pcs



[Inner Box]



[Carton Box]